NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
		104FM14		
BRIEF/WAIST ASSEMBLY, ITEM 104 ---------- 0104-210605- 07/08/09/10/11/12 (1)	2/1RB	Loss of ball bearing retainer screw. Defective screw.	END ITEM: One of two screws from ball bearing retainer missing. GFE INTERFACE: None for single failure. Loss of suit pressure integrity with loss of second screw and plug. MISSION: None for single failure. CREW/VEHICLE: None with loss of one screw. Loss of crewman with loss of two screws. TIME TO EFFECT /ACTIONS: Seconds. TIME AVAILABLE: Minutes. TIME REQUIRED: Immediate. REDUNDANCY SCREENS: A-PASS B-FAIL C-PASS	A. Design - The two screws are fabricated from A-286 stainless steel and procured to AN specifications. Loss of the screws is precluded in design by adherence to standard engineering torque requirements for screw installation. The screws are torqued to 3 in. lbs and the loss of one screw would not lead to loss of the retainer. B. Test - Acceptance: Waist Bearing leakage & torque is conducted per Airlock test procedure 10043 or 10057. PDA: The following tests are conducted at LTA Assembly level in accordance with ILC Document 0111-710112. 1. Proof pressure test at 8.0 + 0.2 - 0.0 psig to verify no structural damage. Certification: The dual seal waist bearing successfully passed SSA certification testing (manned) to duplicate operational life (Ref. "1153 Hour Cert Report for Redesigned Dual Seal Waist Bearing, ILC Doc 0111-719428). The following usage, reflecting requirements of significance to the waist bearing, was documented during certification: Requirement S/AD Actual Pressure Hours 458 1200 Pressure Cycles 300 1080 Waist Rotations 2466 7200 Walking Steps 4320 77760* * The walking steps were accomplished during the Enhanced Certification Testing (Ref. ILC Doc 0111-711330). In addition, the bearing has been subjected to screening tests where the bearing is bench cycled to a crew familiarization test profile with constant leakage monitoring. The bearing passed this test with both seals functioning and with one seal intentionally disabled. Both seals in the cert bearing have been subjected to a proof pressure test at 8.0 psi. C. Inspection - Components and material manufactured to ILC requirements at an approved supplier are documented from procurement through shipping by the supplier. ILC incoming receiving inspection verifies that the hardware received is as identified in the procurement documents, that no damage has occurred during shipment and that supplier certifications have been received which provide traceability information. The following MIP's are performed during the LTA assembly process to assure the failure cause is precluded from the item. Verification of presence of screws during torquing operations.

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During PDA, the following inspection points are performed at the LTA assembly level in accordance with ILC Document 0111-70028J:
1. Visual inspection for material, degradation.

D. Failure History -
None.

E. Ground Turnaround -
None, for every component within its limited life requirements.

Every 4 yrs or 229 hrs of manned pressurized time during waist bearing maintenance the ball retainer screw torque is verified following assembly of the bearing. Following assembly, the bearing is subjected to structural and leakage tests.

F. Operational Use -
Crew Response -
Pre/post-EVA : Single failure not detectable, no response.
EVA : Single failure not detectable, no response.
Special Training - No training specifically covers this failure mode.
Operational Considerations - Not applicable.

EXTRAVEHICULAR MOBILITY UNIT

SYSTEMS SAFETY REVIEW PANEL REVIEW

FOR THE

I-104 LOWER TORSO ASSEMBLY (LTA)

CRITICAL ITEM LIST (CIL)

EMU CONTRACT NO. NAS 9-97150

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